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Honorary Secretary and Curator.

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The Authors alone are responsible for the statements and opinions contained in their respective papers.

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The Year-Book and Calendar of the Essex Field Club for 1905-6.

The Council has decided to issue annually a new publication, to be entitled *The Year-book and Calendar*, of which the first volume, containing four plates, has been sent out to Members. Additional copies may be had from the Hon. Librarian, price 1s., and to Members 9d., post free. It will be published yearly hereafter on the 20th April—that is, shortly after the close of the Club's official year.

Those friends of the Club wishing to extend its sphere of usefulness will find a few copies of the *Year-book* excellent agents for propagandism.

The *Year-book* represents the *business side* of the Club's work. It contains *no scientific matter*, which will continue to appear in the *Essex Naturalist*, as hitherto.

The contents of the *Year-book* includes a Calender of Fixtures for the year, an illustrated Record of the Club's Work in the Past, the Report of the Council and the Treasurer's Accounts for the past year, the Rules, the List of Members, and similar information. Suggestions for the improvement of future issues are invited.

It should be remembered that the *Year-book* is of the nature of a supplement to the *Essex Naturalist*, and the annual copies should be preserved to range with our Journal.

THE BRITISH WOODLICE.

By WILFRED MARK WEBB, F.L.S., and CHARLES SILLEM.

(With Plates I.–XXV., and numerous other Illustrations.)

[*Continued from page 56.*]

In 1857 Kinahan read a paper before the British Association (32) in which he described fourteen species of woodlice from the British Islands, and eleven years later when Bate and Westwood published their book (1), the number had risen to seventeen. One of the species (*Oniscus fossor*), however, was doubtful, and although Dr. Scharff in 1894 (63) rejected it, his list contained also seventeen species, for in the meantime the Rev. T. R. R. Stebbing had found *Ligidium hypnorum* in Surrey (70).

Since then the Rev. Canon Norman, Dr. Scharff, the Rev. T. R. R. Stebbing, and one of the present writers, have added other species, as will be seen from the following pages, in which all those found, up to the present time in the British Islands are described and figured.

We shall now consider in detail the British genera and species of woodlice and give their synonymy and distribution.

Order—ISOPODA.

Tribe—*ONISCOIDA*.

Section—LIGIÆ.

THE TWO DIVISIONS OF THE TAIL APPENDAGES ALIKE IN SHAPE.

Family—LIGIIDÆ.

Flagellum with ten or more joints; tail appendages wholly visible; head without lateral lobes.

Genus—**LIGIA** Fabricius, 1798 (27), p. 301.

Abdomen broad; body large; habitat, the sea-shore.

The genus *Ligia* agrees with *Ligidium* alone, in that the flagellum of the larger antennæ has more than ten joints. In both genera, there are no lateral lobes to the head, and the tail appendages are wholly visible from the upper surface of the body. The latter in *Ligia* is, however, very many times bigger than in *Ligidium* and shows no abrupt decrease in the width of its segments when the abdomen is reached.

Ligia oceanica Linné (The Quay-louse). PLATE I.

1767 *Oniscus oceanicus* Linné (43), p. 1061.
1793 *Cymothoa oceanica* Fabricius (26), p. 509.
1815 *Ligia scopulorum* Leach (38), p 374.
1868 *Ligia oceanica* Bate and Westwood (1), p. 444.
1898 *Ligia oceanica* Sars (59), 156, pl. LXX.

There is but one British species of *Ligia*, and this, the largest member of the whole tribe to be met with in these Islands, usually attains a length of two centimetres, while adult males may be nearly half as long again. It is the *Oniscus oceanicus* of Linnæus and lives on the sea shore, where it may be found at low tide beneath stones and rubbish in the crevices of timber. *Ligia* forms a connecting link between the woodlice proper and the many Isopods which actually live in the sea.

FIG. 35.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Ligia oceanica*.

The colour of the animals is a greenish grey, and the compound eyes are almost black, so that they are very conspicuous; there are from eleven to fourteen joints to the flagellum of the outer antennae and this feature, taken in conjunction with the large size and habitat, is sufficient to identify the species in question.

On the coast of Essex the name "quay-lowders" is given to these crustaceans, "lowder" being apparently an old plural of louse.

It is worthy of mention that Mr. Webb, when in charge of the Marine Biological Station at Brightlingsea, examined a very large male specimen of *Ligia oceanica*, in which the maxillæ were duplicated and consisted of four pairs instead of two.

BRITISH LOCALITIES:—

England: Brightlingsea; (W.M.W.): Maldon; (W.M.W. from R.M.): Southend; (J.A.M.): Whitstable; (W.M.W.) Herne Bay; Margate; Dover; Folkestone; (J.A.M.)

Scotland: Shetland to Cornwall; (Norman, 49).

Ireland: East Coast; West Glengariff; Castletown; Berehaven; Bundoran; (Scharf, 63).

FOREIGN DISTRIBUTION:—

Europe: France; (25); Spain: (12): Denmark, Prussia, Norway, Faroe Islands, Belgium; (59).

Africa: Morocco; (16).

Genus—**LIGIDIUM** Brandt, 1833 (3), p. 173
Zia, Koch (34).
Abdomen narrow; habitat, wet moss.

In *Ligidium* there are numerous joints to the flagellum, lateral lobes are absent from the head, and the tail appendages are completely to be seen. All the segments of the abdomen are distinctly narrower than those of the thorax and in this it agrees with *Trichoniscus*, *Trichoniscoides*, *Philoscia*, and *Metoponorthus*. In these, however, the flagellum has never more than seven joints, the tail appendages (as in all genera but *Ligia* and *Ligidium)* are partially hidden by the last segment, and in all the four but *Philoscia* there are lobes to the head.

Ligidium hypnorum, Cuvier. PLATE II.

1792 *Oniscus hypnorum* Cuvier (9), pl. XXVI., figs. 3—5.
1793 *Oniscus agilis* Persoon, quoted by Koch in Panzer (51), part 5, pl. XXIV.
1830 *Ligia hypnorum* Bosc (2). p. 179.
1833 *Ligidium persoonii* J. F. Brandt (3), p. 174, pl. IV., figs. 6—7.
1840 *Zia agilis* Koch (34), part 34, pls. XXII. and XXIII.
1844 *Ligidium personii* Zaddach (77), p. 17.
1853 *Ligidium personii* Lereboullet (39), p. 14, pl. I., fig. 1, pl. II., figs. 20—31.
1857 *Ligidium personii* Kinahan (32), p. 275, pl. XXI., fig. 14, pl. XXII., fig. 9.
1873 *Zia saundersii* Stebbing (70), p. 286.
1873 *Ligidium agile* Norman (48), p. 419.
1885 *Ligidium hypnorum* Budde-Lund (8), p. 254.
1898 *Ligidium hypnorum* G. O. Sars (59), p. 158 pl. LXXI.

This species, which like the last, is the only British representative of its genus, was added to our fauna in 1873 by the Rev. Thomas R. R. Stebbing (70) who found specimens in the neighbourhood of Copthorne Common, Surrey. Up to the present time, when we are pleased to announce that we discovered it in the spring of 1902 at Warley in Essex, *Ligidium hypnorum* has not been recorded from any other place in the British Islands.

FIG. 36.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Ligidium hypnorum*

As the name of the species implies, it lives in wet situations and in its turn connects *Ligia* with the forms which inhabit drier places. *Ligidium hypnorum* might be mistaken for *Philoscia muscorum*, but as already pointed out in the generic description, the latter has but a few (three) joints to the flagellum, instead of from ten to thirteen. From *Ligia*, the species under consideration is distinguished by its small size, narrow abdomen, and habitat.

BRITISH LOCALITIES:—

England: Warley, Essex; (W.M.W.): Copthorne Common, Surrey; (Stebbing, 70).

FOREIGN DISTRIBUTION:—

Europe: France; (25): Sweden, Denmark, Germany; (59): Turkey; (8).

Family—TRICHONISCIDÆ.

Flagellum with less than ten joints; head with lateral lobes; tail appendages partly hidden.

Genus—**TRICHONISCUS** Brandt, 1833 (3), p. 174.

Abdomen narrow; eyes compound; flagellum, usually with more than three joints

In *Trichoniscus* the flagellum may have from seven to four (rarely three) joints. As in *Trichoniscus* and *Haplophthalmus* there are lateral lobes to the head, though these are not very pronounced; the body is also of small size, the abdomen narrow with both divisions of the tail appendages equally so, and almost of the same length though slightly covered by the last segment. The compound eyes distinguish *Trichoniscus* from the two genera named, and from *Platyarthrus*, while its small size and the character of its tail-parts mark it out from all others.

Trichoniscus pusillus Brandt. PLATE III.

1833 *Trichoniscus pusillus* Brandt (3), p. 174, pl. IV., fig. 9.
1838 *Itea riparia* Koch (34), part 22, pl. XVII.
1844 *Itea lævis* Zaddach (77), p. 16.
1857 *Philougria celer* Kinahan (32), p. 281, pl. XXII., figs. 1–4.
1858 *Philougria riparia* Kinahan (33), pp. 191 and 198, pl. XXIII., fig. 1.
1868 *Philougria riparia* Bate and Westwood (1), p. 456.
1898 *Trichoniscus pusillus* Sars (59), p. 161, pl. LXXII, fig. 1.

This tiny species is found commonly amongst the roots of the herbage in very moist places. It presents a horny translucent appearance and is of a reddish brown colour. It runs with considerable speed, and when it is moving, the white irregular lines with which it is beset are not evident. *Trichoniscus pusillus* is very much like *Trichoniscus vividus* in colour but the latter species is nearly twice as big and has from five to seven joints to the flagellum, while the former has never more than four. *Trichoniscus roseus* is also much larger and its bright red colour (which it loses, however, when preserved in alcohol) is another means of distinguishing it from the species under consideration.

Professor Sars in his *Crustacea of Norway* (p. 162) describes from Christiania, under the name of *Trichoniscus pygmæus*, a still smaller species. As this may possibly be discovered in this country a brief comparison between it and *Trichoniscus pusillus* may be of value. The former reaches a length of but two millimetres; it is "whitish, semi-pellucid with a few light brown pigmentary ramications across the segments and a double row of irregular opaque patches along the middle of its back" (p. 163). Its body is covered with minute tubercles and there are only three joints to the flagellum; its movements are by no means rapid.

FIG. 37.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Trichoniscus pusillus*.

The body of *Trichoniscus pusillus* is smooth and polished. It has four joints to the flagellum —Dr. Scharff (63) says three or four—and it moves quickly.

BRITISH LOCALITIES:—

England: Brightlingsea; Warley; (W.M.W.): Epping Forest; (Bate and Westwood, 1); Hanwell; Southall; Kew Gardens; Langley; Burnham Beeches; Dropmore; Skirmett; Bluebell Hill, Maidstone; (W.M.W.): Chislehurst; Plymouth; Polperro; Looe; (Bate and Westwood, 1): Hertfordshire; Northumberland; Durham; (Norman, 49): Exeter; (Parfitt, 53).

Scotland: Edinburgh; (Scott, 68): Cumbrae; (D. Robertson, 57).

Ireland: Connemara; (Norman, 49): Dublin; Wexford; Cork and Kerry; (Percival Wright *teste* Bate and Westwood, 1): Tyrone; Waterford; Portlaw; Kilkenny; Wicklow; (Kinahan 33).

FOREIGN DISTRIBUTION:—

Europe: France; (25): Spain; (15): Italy; (19): Norway; Sweden; Denmark; Germany; (59).

Africa: Algeria; Tunis; Azores; (24).

America: Niagara; North America; (59).

Trichoniscus vividus, Koch. PLATE IV. (from a spirit specimen).

1840 *Itea vivida* Koch (34), part 34, pl. IV.
1858 *Philougria vivida* Kinahan (33), pp. 197 and 198, pl. XXIII., fig. 2.
1868 *Philougria vivida* Bate and Westwood (1), Vol. II., pp. 458 and 459, figs.

This species is claret-brown in colour and under a lens it is seen to be marbled with white, indeed in appearance it is much like *Trichoniscus pusillus* though twice the size. There are important differences between the two species as regards the number of joints to the flagellum. These vary from five to seven in *Trichoniscus vividus* while in the other, as already pointed

out, there are not more than four. The body is practically speaking smooth for it bears only very small tubercles, widely separated. In *Trichoniscus vividus* the antennæ lack the bristles which characterise those of the other species in the genus. The species under consideration was discovered by Dr. Kinahan in March, 1858, at Portlaw, Co. Waterford and is active even amongst the snow.

FIG. 38.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Trichoniscus vividus*.

BRITISH LOCALITIES:—

Ireland: Portlaw, Co. Waterford; (Kinahan, 33): Cappagh, Co. Waterford; (Scharff, Irish Nat., Vol. IX., p. 158): Borris, Co. Carlow; (Scharff, 64.)

FOREIGN DISTRIBUTION:—

Europe: Spain; (12).

Trichoniscus roseus Koch. PLATE V.

1838 *Itea rosea Koch* (34), part 122, pl. XVI.
1858 *Philougria rosea* Kinahan (33), pp. 197 and 199, pl. XXIII., fig. 3.
1858 *Philougria rosea* Bate and Westwood (1), p. 460
1898 *Trichoniscus roseus* Sars (59), p. 163, pl. LXXIII, fig. 1.

The third British species of *Trichoniscus* is of a deep pink colour and has a light yellow stripe down the back (in some habitats the animals are said to be quite white). Arranged in transverse rows upon the body are large tubercles, each of which under strong magnification will be found to end in a tiny hair. It is distinguished from *Trichoniscus pusillus* by the larger size of its body, which is also comparatively broader, and from *Trichoniscus vividus* by the four joints of the flagellum of its antennæ which latter have strong bristles upon them. In the former species there are five or more joints to the flagellum and the antennæ, though hairy, lack the bristles. *Trichoniscus roseus* is to be looked for in old gardens.

FIG. 39.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Trichoniscus roseus*.

BRITISH LOCALITIES:—

England: Warley; (W.M.W.): Maldon; W.M.W. from R.M.); Stanmore; Hanwell; Ealing; Wimbledon; (W.M.W.): Berkhamsted; Torquay; (Norman,49): Plymouth; (Bate and Westwood, 1 and B.M.,): Grassendale, near Liverpool; (R.W.): Newtownards; (R.W., Irish Nat, 1904, p. 260.)

Scotland: Tarbert; (Scott, 68).

Ireland: Dublin; Ballyfinder, Co. Down; (Scharff, 63): Templeogue; Dundrum; Blackrock; Rathgar, Co. Dublin; Bray, Co. Wicklow; (R.F.S.): Oakleigh; Kerry; (R.W.): Belfast; (Welch, Irish Nat., 1896, p. 213.): At the grave of Josiah Welch (grandson of John Knox), Castle Upton; Richhill, Co. Armagh; Castleconnell Ferry; (R.W.): Glenade House, Co. Antrim; (R.W. from R. Ll.; Praeger).

FOREIGN DISTRIBUTION:—

Europe: France; (25): Spain; (12): Italy; (59): Denmark; Germany; Holland; (39): Dalmatia; (18).

Africa: Algeria; Tunis; (24).

Genus—**TRICHONISCOIDES**, Sars, 1898 (59), p. 164.

Abdomen narrow; eyes simple; (or wanting); flagellum, with four joints.

The members of this genus are very much like those of *Trichoniscus*. In the latter, however, the hinder legs are longer in proportion and the eyes are compound.

Trichoniscoides albidus Budde-Lund. PLATE VI.

1879 *Trichoniscus albidus* Budde-Lund (7) p. 9.
1898 *Trichoniscoides albidus* Sars (59), p. 165, pl. LXXIII., fig. 2.

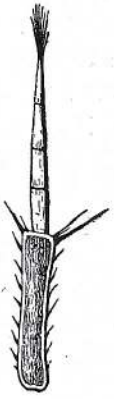


FIG. 40.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Trichoniscoides albidus*.

We are able to include this species, as a specimen was found by Mr. Webb at Eton Wick in the summer of 1898. It is one of a number of species which the Rev. Canon Norman (49, p. 18) suggested as likely to be British. It is the only representative of its genus, which does not differ in any very important characters from the others in the family. The narrow elongated body will serve to separate it from *Trichoniscus vividus* and *Trichoniscus roseus*, but on account of its size, which is much the same as that of *Trichoniscus pusillus* and the two British species of *Haplophthalmus*, it will be advisable to give some further points of distinction. From the first its white colour will serve to differentiate it; the other two lack the narrow abdomen seen in *Trichoniscoides albidus*. Moreover, not one of the three shows the serrations on the side plates which characterise the species under

consideration. *Platyarthrus hoffmannseggii* is small and white and the edges of its side plates are toothed, but it is oval in shape, possesses no eyes, and its stout antennæ have but a single joint to the flagellum instead of four. On the Continent this species has been found in rich soil.

BRITISH LOCALITIES :—

England: Eton; (Stebbing, 71a, p. 113).

FOREIGN DISTRIBUTION :—

Europe: France; Wimereux and Lyons, Forêt (25) : Norway; Denmark; (59)

Genus—**HAPLOPHTHALMUS** Schobl, 1850 (66), p. 449 · *Abdomen broad (comparatively); eyes simple; flagellum with three joints; back with longitudinal ridges.*

The body of *Haplophthalmus* is long in proportion to its width, but there is no abrupt decrease in the breadth of the abdomen as seen in *Trichoniscus* and *Trichoniscoides*. The eyes are simple as in the latter genus and the lateral lobes of the head are rather large, while the side plates of the body are well separated.

Haplophthalmus mengii Zaddach. PLATE VII.

1844 *Itea mengii* Zaddach (77), p. 16.
1860 *Haplophthalmus elegans* Schobl (66), p. 449.
1885 *Haplophthalmus mengii* Budde-Lund (8), p. 250
1898 *Haplophthalmus mengii* Sars (59), p. 167, pl. LXXIV., fig. 1.

The Rev. Canon Norman discovered two specimens of this species in Ireland in June, 1899 (50); in the previous year one of us (Mr. Webb) found a single example at Eton Wick.

FIG. 41.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Haplophthalmus mengii*.

The main differences between the members of this genus and their allies are set forth in the generic description and incidentally elsewhere, so we shall content ourselves with giving the distinctive points of the two British species. *Haplophthalmus mengii* has a number of raised longitudinal ribs on each segment of the thorax, the outer ridges being somewhat broken. There are also two prominent ribs upon the third segment of the abdomen.

BRITISH LOCALITIES :—

England: Eton; (Stebbing, 71a, p. 114).

Ireland: Corcumroe Abbey; Co. Clare (Norman, 50).

FOREIGN DISTRIBUTION :—

Europe: France; (25): Norway; Prussia; Germany; Bohemia; (59).

Haplophthalmus danicus Budde-Lund. PLATE VIII.

1870 *Haplophthalmus elegans* Budde-Lund 6), p. 228 (not *Haplophthalmus elegans* Schobl).
1879 *Haplophthalmus danicus* Budde-Lund (7), p. 9.
1881 *Haplophthalmus mengii* Weber (76), p. 192, pl. V., figs. 7-9 (not *Itea mengii* Zaddach).
1885 *Haplophthalmus danicus* Budde-Lund (8), p. 250.
1898 *Haplophthalmus danicus* Sars (59), p. 168, pl. LXXIV., fig. 2.

This species was added to the British list by the Rev. Canon Norman (49), who found a colony in his garden at Berkhamsted. It has rows of tubercles on its thorax instead of ridges, and there are no ribs at all upon the abdomen. The front of the head projects further comparatively and forms a more acute point than in *Haplophthalmns mengii* and it is not so purely white in colour as the latter species.

FIG. 41 —FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Haplophthalmus danicus*.

BRITISH LOCALITIES:—

England: Warley Place; (W.M.W. from Miss Willmott): Queen's Cottage, Kew Gardens; Stanmore; Hanwell, garden at Odstock, Bennett's Nurseries;(W.M.W.): Berkhamsted; (Norman, 49).

FOREIGN DISTRIBUTION:—

Europe: France; (25); Denmark; Holland; Germany; (Dollfus, Feu de Jeun, Nat., April, 189[illegible]) : Norway; (Sars, 59).

Section—ONISCI.

THE OUTER DIVISIONS OF THE TAIL APPENDAGES BROADER THAN THE INNER ONES.

Family—ONISCIDÆ.

Tail appendages projecting when the animal is walking.

(1.) Unable to roll up into a complete ball.

Genus—**ONISCUS** Linné 1746 (41), p. 360.

Flagellum, with three joints; abdomen broad; head with lateral lobes.

The characters given above taken in conjunction with the size of the animals will serve to distinguish the members of this genus.

Oniscus asellus Linné (The "Common Slater.") PLATE IX.

1761 *Oniscus asellus* Linné (41), p. 500, No, 2058.
1792 *Oniscus murarius* Cuvier (9), p. 22, pl. XXVI.
1838 *Oniscus fossor* Koch (34), part 22, pl. XXII.
1868 *Oniscus asellus* Bate and Westwood (1), p. 468.
1868 *Oniscus fossor* Bate and Westwood (1), pp. 471-2.
1898 *Oniscus asellus* Sars (59), p. 171, pl. LXXV.

Oniscus asellus is one of the largest of our woodlice and it is also probably the commonest, though *Porcellio scaber* is in many places quite as abundant. The body of *Oniscus* is broad and expanded and the colour is usually a slate grey with yellowish markings more or less regularly arranged.

From the genus *Porcellio* the species with which we are concerned is at once distinguished by the three jointed flagellum. *Porcellio* has but two joints and has besides a prominent lobe projecting from the middle of the head, which is not seen in *Oniscus*. *Philoscia*, although it has three joints to the flagellum, has a narrow abdomen and lacks entirely the lateral lobes which are a feature of the other genera of Oniscidæ.

FIG. 43.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Oniscus asellus*.

Oniscus fossor of Koch (34) was recognized by Kinahan and by Bate and Westwood as a species. Dr. Scharff submitted specimens to Professor Budde-Lund who found no differences between them and *Oniscus asellus*. The former (63) mentions, however, that the characteristics of the supposed species are those of young examples of *Oniscus asellus*, and Professor Sars (59, p. 173) seems to be of the same opinion. Many young examples of *Oniscus asellus* that we have examined have a curious whitish transverse band owing to the light colour of the dorsal plates of the first abdominal segments. The flagellum also does not seem to shew in young animals a distinct division into three joints.

BRITISH LOCALITIES:—

England: High Beach, Epping, including an albino; Maldon; Brightlingsea; Iver; Hanwell; Eton; Kew; Pamber Forest; Kingston-on-Soar; Bluebell Hill, Maidstone; (W. M. W.): Lynmouth; (W.M.W. from J.T.C.).

Scotland: (Scharff, 63). Dinnet, Aberdeenshire; (W.M.W. from Madame Christen

Ireland: (Scharff, 63). Yellow form with black spots, Donegal (R.W.)

FOREIGN DISTRIBUTION:—

Europe: Almost throughout; (12): France; (25): Spain; (12): Sweden; Norway; Denmark: Germany; Holland; Italy; Iceland; (59): Faroe Islands; Thornsharn; (R.F.S.)

Africa: Azores; (24).

America: Greenland; (59): North America; (Budde-Lund).

Genus—**PHILOSCIA** Latreille, 1804 (37), p. 43.

Flagellum with three joints; abdomen narrow; head without lateral lobes.

If any further differences of an obvious kind be required to distinguish *Philoscia* from *Oniscus*, one at least will be found in the much greater development of the hinder legs in the former genus.

Philoscia muscorum Scopoli. PLATE X.

[Not of Lereboullet, which is an *Oniscus*, see Bate and Westwood (1).]

1763 *Oniscus muscorum* Scopoli (67), p. 415.
1793 *Oniscus sylvestris* Fabricius (26), p. 397.
1793 *Oniscus agilis* Koch in Panzer (51), part 9, pl. XXIV.
1833 *Philoscia marmorata* Brandt (3), p. 183.
1838 *Ligia melanocephala* Koch (34), part 22, pl. XVIII.
1847 *Zia melanocephala* Koch (38), part 40, pl. I. ?, p. 212.
1868 *Philoscia muscorum* Bate and Westwood (1), p.
1898 *Philoscia muscorum* Sars (59), p. 174, pl. LXXVI., fig. 1.

This species lives chiefly at the roots of grass and under the stones or sticks that lie among it. *Philoscia muscorum* has a very smooth and shining body, and its long legs enable it to move very rapidly. The ground colour of its dorsal surface varies from light yellow to deep brown. There are characteristic dark markings down the middle of the thorax and on the sides, between which are lighter patches. In dark coloured specimens the markings are by no means so evident.

FIG. 44.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Philoscia muscorum*.

BRITISH LOCALITIES:—

England: High Beach, Epping; Warley; (W.M.W.): Maldon; (W.M.W. from R.M.): Kew; Langley; Hanwell, yellow variation; Bluebell Hill, Maidstone; (W.M.W.): Liphook; (C.S.): Pamber Forest; Kingston-on-Soar; (W.M.W.)

Scotland: (Scott, 68).

Ireland: Almost throughout; (Scharff, 63).

FOREIGN DISTRIBUTION:—

Europe: France; (25): Spain; (12): Sicily; (19): Hertsogovinia; (22): Sweden; (21): Norway; Denmark; Prussia; Germany; Holland; Poland; Austria; Italy; (59): Sardinia; (21).

Africa: Algeria; Tunis; (24).

Philoscia couchii Kinahan. PLATE XI.

1858 *Philoscia couchii* Kinahan (33), p. 195, pl. XXIII., fig. 4.
1868 *Philoscia couchii* Bate and Westwood (1), p.
1885 *Ligidium couchii* Budde-Lund (8), p. 257.
1885 *Philoscia longicornis* Budde-Lund (8), p. 221,
1897 *Philoscia couchii* Dollfus (21), p. 72, pl. I., fig. 1.

Philoscia couchii is an inhabitant of the sea-side; it is smaller than the last species, its colour to the naked eye is a uniform lead-grey, and its antennæ are very large (compared with its size) and hairy.

FIG. 45.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Philoscia couchii*.

This species was discovered by Professor Kinahan when in the company of Messrs. Bate and Westwood near Polperro in Cornwall in the year 1858, and dried specimens presented by him are in the British Museum (Natural History).

BRITISH LOCALITIES:—

England: Talland Cove; Polperro; (Bate and Westwood, 1): Salcombe, Devon; (Norman, 49): Meadefoot, Torquay; (Stebbing in 49).

FOREIGN DISTRIBUTION:—

Europe: France; (25): Spain; (12): Sicily; (19): Sebastopol; (Norman, 49).

Africa: Azores; Canaries; Morocco; Algiers; Tunis; Egypt; Senegal; (24).

Atlantic Isles: Canaries; Azores; (21),

Asia: Syracuse; Bazone (18).

Genus—PLATYARTHRUS Brandt, 1833 (3), p. 174.

[*Typhloniscus* Schöbl (66), p. 279.]

Flagellum with one joint; eyes wanting; abdomen broad; habitat, ants' nests.

The broad body, which is much flattened, and the very thick antennæ distinguish *Platyarthrus* from the other small woodlice (Trichoniscidæ).

Platyarthrus hoffmannseggii Brandt. PLATE XII.

1833 *Platyarthrus hoffmannseggii* Brandt (3), p. 174, pl. IV., fig. 10.
1844 *Ilea crassicornis* Koch (34), part 36, pl. V.
1860 *Typhloniscus steinii* Schobl (66), p. 282.
1868 *Platyarthus hoffmannseggii* Bate and Westwood (1), p.
1898 *Platyarthrus hoffmannseggii* Sars (59), p. 175, pl. LXXVI., fig. 2.

Up to the present this is the only woodlouse which has been found in the nests of British ants. It is small and oval, its

colour is white, and its body is covered with tubercles. The edges of its side plates are toothed, its flagellum has but a single joint and it has no eyes.

Miss Kate Hall tells us that, if very hungry, ants in captivity will kill and eat *Platyarthrus*. With regard to its own food, Lord Avebury has favoured us with the opinion that it lives on the spores of the lower plants, such as would be found in the ants' nest.

FIG. 46.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Platyarthrus hoffmannseggii*.

BRITISH LOCALITIES :—

England: Warley; Hanwell; West Drayton; Langley; Kingston-on-Soar; Bluebell Hill, Maidstone; (W.M.W.): Berkhamsted; Salcombe; Devon; Cheddar Cliffs, Somerset; (Norman, 49): Ide, near Exeter; (Parfitt, 53): Torquay; (Stebbing in 49); Lulworth Cove; (Rev. A. R. Hogan *teste* Bate and Westwood, 1): Hammersmith; Oxford; Berry Head, Torquay; Plymouth; (Bate and Westwood, 1): In the nest of *Myrmica rubra*, Newton Ferrers (E. E. Lowe).

Scotland: Banff; (Thomas Edward in 49).

Ireland: Leixlip, Co. Dublin; Lissmore, Co. Waterford; Glengariff, Co. Cork; (Scharff, 63): Bagenalstown, Co. Carlow; (64).

FOREIGN DISTRIBUTION :—

Europe: France; (28): Spain; (12): Denmark; Germany; Holland; Bohemia; Austria; Tyrol; Helvetia; (59).

NOTE.—In the genera which follow, air-tubes or air-cavities (tracheæ) are present in the outer plates of the abdominal appendages, 1 and 2, or 1 to 5. The appendages in question have in consequence a milk-white appearance in the living animal owing to the fact that the enclosed air reflects white light. Considerable interest attaches to the study of these tracheæ, which have the same function as those of insects, but which have been independently developed. To emphasise the latter fact the structures are often termed "pseudo-tracheæ."

Genus—**PORCELLIO** Latreille, 1804 (37), p. 45.

Flagellum, with two joints; abdomen, broad; frontal lobe projecting.

Porcellio is easily separated from the previous genera—*Oniscus*, *Philoscia*, and *Platyarthrus*—by its two-jointed flagellum. The fact that the abdomen is not abruptly narrowed separates it from *Metoponorthus*, which also lacks the prominent frontal lobe so characteristic of *Porcellio*. The species of this genera might be confused with *Cyclisticus* which has two joints to the flagellum and a broad abdomen, but the latter genus has the power of rolling itself into a ball, while its frontal lobe is very small, and the first segment of its thorax is comparatively larger than in any species of *Porcellio*.

Porcellio scaber Latreille. PLATE XIII.

1804 *Porcellio scaber* Latreille (37), p. 45.
1818 *Oniscus granulatus* Lamark (36), p. 261.
1818 *Porcellio nigra* Say (62), p. 432.
1840 *Porcellio brandtii* Milne-Edwardes (46), p. 168.
1840 *Porcellio dubius* Koch (34), part 34, pl. VIII.
1847 *Porcellio asper* Koch (35), p. 207, pl. VIII., fig. 98.
1857 *Porcellio montezumæ* Saussure (60), p. 207.
1865 *Porcellio paulensis* Heller (31), p. 136, p. XII., fig. 5.
1868 *Porcellio scaber* Bate and Westwood (1), p.
1876 *Porcellio graniger* Miers (44), p. 223.
1885 *Porcellio graniger* Budde-Lund (8), p. 149.
1898 *Porcellio scaber* Sars (59), p. 176, pl. LXXVII.

The body of *Porcellio scaber* is densely covered with tubercles. Its colour is usually of a very dark grey, but at times it is quite red or variegated with yellow. Albino specimens have been recorded. The two joints of the flagellum are of the same length and together equal that of the last joint of the peduncle. Air-tubes are present in the outer plates of the first two abdominal appendages.

FIG. 47.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Porcellio scaber*.

BRITISH LOCALITIES:—

England: High Beach, Epping; Warley; Brightlingsea; (W.M.W.): Maldon; (W.M.W. from R.M.): Langley; Kew; Skirmett; Pamber Forest; (W.M.W.): Liphook; (C.S.): Stoke-on-Trent; Kingston-on-Soar; (W.M.W.)

Scotland: Dinnet (W.M.W. from Madame Christen.

Ireland: Common everywhere; (Scharff, 63.)

FOREIGN DISTRIBUTION:—

Europe: Throughout; (59): France; (28): Spain; (15): Iceland; (59): Faroe Isles—Thorsharn and Naalsoe—(R.F.S. and B.M., N. Annadale).

America: Greenland; North America; Sandwich Isles; (B.M.); Mexico; (59): St. Paul; St. Croix; (59); Ascension; Tristan; d'Acunha; (23).
Asia: Ceylon; Kamtschatka: (23).
Australia: Melbourne; Sydney; Tasmania; New Zealand; (B.M., Chilton).
Africa: Azores; Canaries; Cape of Good Hope; (24)

Porcellio pictus Brandt and Ratzeburg. PLATE XIV.

1833 *Porcellio pictus* Brandt and Razteburg (4). p. 78, pl. 12, fig. 5.
1839 *Porcellio melanocephalus* Koch (34), part 28, pl. XVIII.
1853 *Porcellio melanocephalus* Schnitzler (65), p. 24.
1856 *Porcellio mixtus* Fitch (29), p 120
1868 *Porcellio pictus* Bate and Westwood (1), p.
1898 *Porcellio pictus* Sars (59), p. 177, pl. LXXVII., fig. 1.

There are tubercles on the body of *Porcellio pictus*, which is a striking looking animal. Its head is black with the lateral lobes curved outwards; there is a dark band down the middle of the back and commonly two others on each side, with more or less conspicuous yellow markings between.

The distal (terminal) joint of the flagellum is but half the length of the proximal one and the last peduncular joint is longer than the two combined.

The abdominal appendages—1 and 2—are provided with air-tubes.

FIG. 48.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Porcellio pictus*.

BRITISH LOCALITIES:—

England: Maldon; (W.M.W. from R.M.): Chislehurst; (Bate and Westwood, 1): Cooper's Hill, near Cheltenham; (Norman, 49): Exeter; (Parfitt, 53): Kent; (Bate and Westwood, 1.)

Scotland: Between Leith and Portobello; (Scott, 68): Cumbrae (Scott, 68a): Ayrshire; (Boyd in Norman, 49): Banff; (T. Edwards in Norman, 49).

Ireland: Dublin; Belfast; Bate and Westwood, 1): Galway Maryborough; Queen's Co., Castel; and Caher Co. Tipperary; (R.F.S.)

FOREIGN DISTRIBUTION:—

Europe: France; (25): North, West-Central, and East Europe; (8): Sweden; Norway; Denmark; Germany; Hungary; Russia; 59.
North America: (8).

Porcellio dilatatus Brandt. PLATE XV.

1833 *Porcellio dilatatus* Brandt and Ratzeburg (4), p. 78, pl. 12., fig. 6.
1840 *Porcellio scaber* Milne-Edwards (not Latreille) (46), p. 167.
1868 *Porcellio dilatatus* Bate and Westwood (1), p.
1898 *Porcellio dilatatus* Sars (59), p. 179, pl. LXXVII., fig. 2.

The fact that *Porcellio dilatatus* is more than half as broad as it is long at once distinguishes it from the other species of *Porcellio*. It is tuberculated and of somewhat a lighter grey than *Porcellio scaber* usually is. The two species agree in having the two joints of the flagellum equal, but the last peduncular joint, as in *Porcellio pictus*, is longer than the flagellum.

FIG. 49.—FLAGELLUM AND LAST PEDUNCULAR JOINT OF THE ANTENNA OF *Porcellio dilatatus*.

As in the two preceding species, air-tubes are found in the outer plates of the appendages on the first two abdominal segments. *Porcellio dilatatus* is to be looked for near houses.

BRITISH LOCALITIES:—

England: Maldon; (W.M.W. from R.M.): Eton; (Stebbing from W.M.W., 71a): Berkhamsted; (Norman, 50): Headley, Surrey; Ventnor; (Stebbing in Norman, 49).

Ireland: Dublin; (Scharff, 63): Dundrum; (Scharff in Norman, 50): Galway; Roundstone; (R.F.S.): Belfast; (C. W. Buckle, Irish Nat., Vol. XI. (1902), p. 43).

FOREIGN DISTRIBUTION:—

Europe: France; (25): Spain; (12); Denmark; Norway; Germany; Poland; Holland; (59).

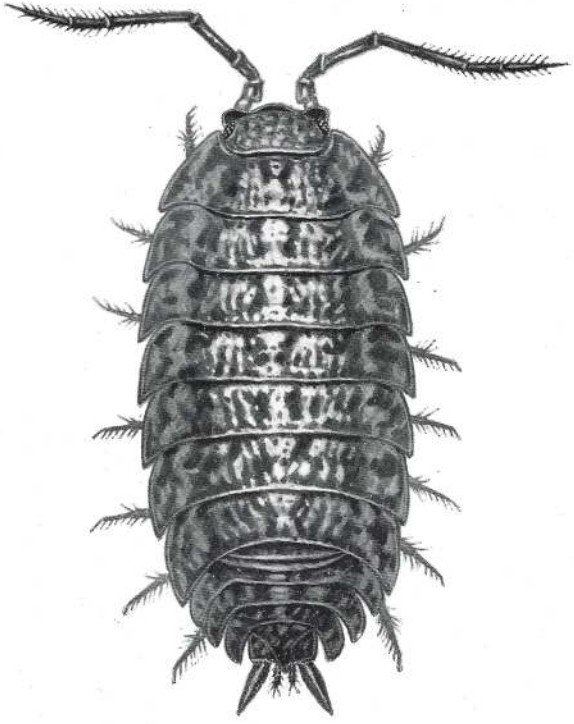
Africa: Madeira; Azores; (24).

Australia: New Guinea; (59).

Porcellio rathkei Brandt. PLATE XVI.

1833 *Porcellio rathkei* Brandt (3), p. 177, fig. 10.
1833 *Porcellio ferrugineus* Brandt (31, p. 178.
1840 *Porcellio trilineatus* Koch (34), part 34, pl. IX.
1853 *Porcellio trivittatus* Lereboullet (39), p. 54, pl. I., figs. 13 and 14.
1853 *Porcellio tetramoerus* Schnitzler (65), p. 24.
1853 *Porcellio striatus* Schnitzler (65), p. 24.

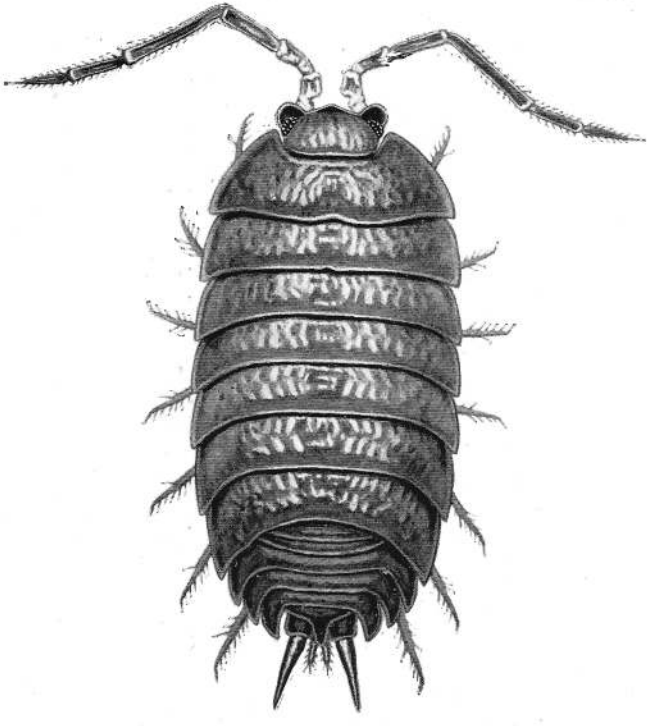
There is often a light band down the back and one on either side of it near the margin in *Porcellio rathkei* (especially in the males), with other more irregularly arranged light patches between. Unlike the three species previously considered, the present one has a smooth body. The distal joint of the flagellum is the longer, and the flagellum itself is equal in length to the last joint of the peduncle.



PORCELLIO RATHKEI Brandt.

Length, twelve millimetres.

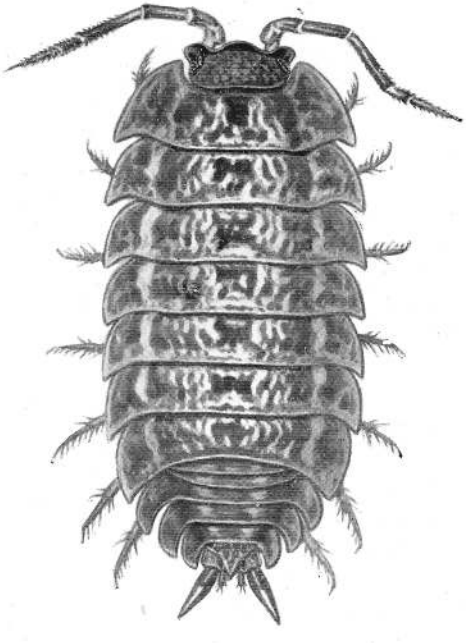
Charles Sillem, del. ad nat. F. W. Reader, sculpt.



PORCELLIO LAEVIS Latreille.

Length, sixteen millimetres.

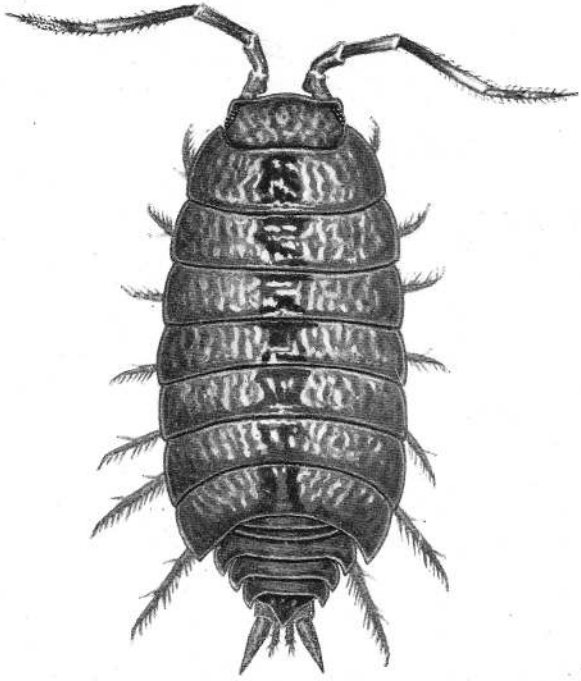
Charles Sillem del. ad nat. F. W. Reader, sculpt.



PORCELLIO RATZEBURGII Brandt.

Length, eleven millimetres.

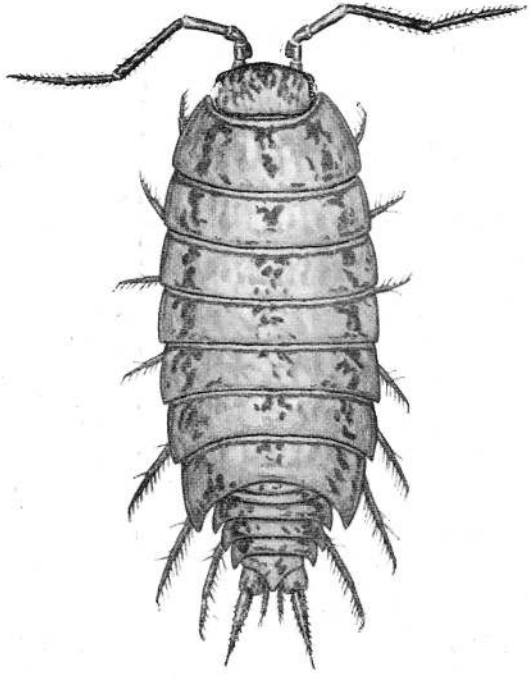
Charles Sillem, del. ad nat. F. W. Reader, sculpt.



METOPONORTHUS PRUINOSUS Brandt.

Length, nine millimetres.

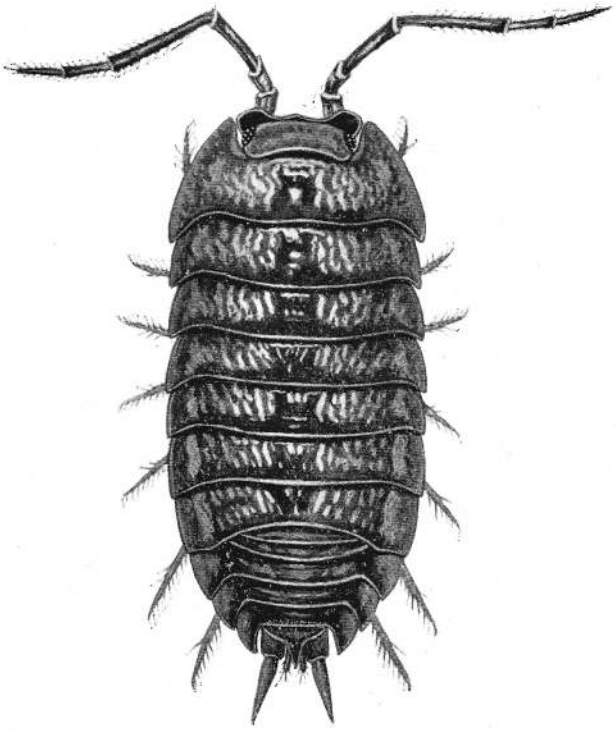
Charles Sillem del. ad nat. F. W. Reader, sculpt.



METOPONORTHUS CINGENDUS Kinahan.

Length, six millimetres.

Charles Sillem, del. ad nat. F. W. Reader, sculpt.



CYLISTICUS CONVEXUS De Geer.

Length, twelve millimetres.

Charles Sillem, del. ad nat. F. W. Reader, sculpt.

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